AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of forming a chalcogenide material containing device, the method comprising the acts of:

forming a stack of one or more layers over a substrate, the stack including at least one layer of chalcogenide material and at least one metal containing layer;

forming a protective layer over the stack, the protective layer blocking light, being conductive, and being etchable with the other layers of the stack, the metal of the metal containing layer being substantially insoluble in the protective layer;

patterning the stack and the protective layer; and

subsequently etching each layer of the stack and the protective layer.

2. (Original) The method of claim 1, wherein the metal containing layer comprises silver.

3. (Original) The method of claim 1, wherein the act of patterning the stack comprises forming and photo patterning a layer of photoresist on the protective layer.

4. (Original) The method of claim 3, wherein the act of patterning the stack comprises exposing the photoresist to a TMAH containing photo developer.

5. (Original) The method of claim 3, further comprising the act of removing the photoresist using a wet acid process.

6. (Original) The method of claim 3, further comprising the act of removing the photoresist using a dry strip process.

7. (Original) The method of claim 3, further comprising the act of removing the photoresist using a scrub process.

8. (Original) The method of claim 1, further comprising the act of performing photolithographic rework subsequent to the act of etching.

9. (Original) The method of claim 1, wherein the act of forming the protective layer comprises forming a layer of tungsten.

10. (Original) The method of claim 1, wherein the act of forming the protective layer comprises forming a composite layer of tungsten/tantalum nitride.

11. (Original) The method of claim 1, wherein the act of forming the protective layer comprises forming the protective layer having a thickness between approximately 50 Å to approximately 500 Å.

12. (Original) The method of claim 1, wherein the act of forming the protective layer comprises forming the protective layer having a thickness between approximately 50 Å to approximately 100 Å.

13. (Original) The method of claim 1, wherein the act of etching comprises performing a halogen containing reactive ion etch process.

14. (Original) The method of claim 1, wherein the act of etching comprises performing an argon sputter etch process.

15. (Original) The method of claim 1, wherein the metal containing layer and the chalcogenide material layer are a same layer.

16. (Currently amended) A method of fabricating resistance variable memory elements, the method comprising:

forming a first electrode over a substrate;

forming a stack of one or more layers over the first electrode, the stack comprising at least one layer of chalcogenide glass and at least one metal containing layer;

forming a protective layer over the stack, the protective layer blocking light, being conductive, and being etchable when etching the stack, the metal of the metal containing layer being substantially insoluble in the protective layer;

patterning the stack and the protective layer; and

subsequently etching each layer of the stack and the protective layer.

17. (Original) The method of claim 16, wherein the metal containing layer comprises silver.

18. (Original) The method of claim 16, wherein the act of patterning the stack comprises forming a layer of photoresist on the protective layer.

19. (Original) The method of claim 18, wherein the act of patterning the stack comprises exposing the photoresist to a TMAH containing photo developer.

20. (Original) The method of claim 18, further comprising the act of removing the photoresist using a wet acid process.

21. (Original) The method of claim 18, further comprising the act of removing the photoresist using a dry strip process.

22. (Original) The method of claim 18, further comprising the act of removing the photoresist using a scrub process.

23. (Original) The method of claim 16, further comprising the act of performing photolithographic rework subsequent to the act of etching.

24. (Original) The method of claim 16, wherein the act of forming the protective layer comprises forming a layer of tungsten.

25. (Original) The method of claim 16, wherein the act of forming the protective layer comprises forming a composite layer of tungsten/tantalum nitride.

26. (Original) The method of claim 16, wherein the act of forming the protective layer comprises forming the protective layer having a thickness between approximately 50 Å to approximately 500 Å.

27. (Original) The method of claim 16, wherein the act of etching comprises performing a halogen containing reactive ion etch process.

28. (Original) The method of claim 16, wherein the act of etching comprises performing an argon sputter etch process.

29. (Original) The method of claim 16, wherein the metal containing layer and the chalcogenide material layer are a same layer.

30. (Currently amended) A method of fabricating resistance variable memory elements, the method comprising:

forming a first electrode over a substrate;

forming a stack of layers by:

forming a first layer of Ge_xSe_{100-x} over the first electrode;

forming a layer of Ag_2Se over the first layer of Ge_xSe_{100-x};

forming a second layer of Ge_xSe_{100-x} over the layer of Ag_2Se;

forming a layer of Ag over the second layer of Ge_xSe_{100-x};

forming a third layer of Ge_xSe_{100-x} over the layer of Ag;

forming a protective layer on the third layer Ge_xSe_{100-x};

patterning the stack and the protective layer using photolithographic processes; and

subsequently etching ~~the stack~~ the first layer of Ge_xSe_{100-x}, the Ag_2Se layer, the second layer of Ge_xSe_{100-x}, the Ag layer, the third layer of Ge_xSe_{100-x} and the protective layer.

31. (Original) The method of claim 30, wherein the act of forming the protective layer comprises forming a layer of a light blocking material.

32. (Original) The method of claim 30, wherein the act of forming the protective layer comprises forming a layer of a conductive material.

33. (Original) The method of claim 30, wherein the act of forming the protective layer comprises forming a layer of a material in which silver is substantially insoluble that is etchable when etching the stack.

34. (Original) The method of claim 30, wherein the act of forming the protective layer comprises forming a layer of tungsten.

35. (Original) The method of claim 34, wherein the act of forming the layer of tungsten comprises forming the layer of tungsten having a thickness between approximately 50 Å and approximately 500 Å.

36. (Original) The method of claim 30, wherein the act of forming the first layer of Ag_2Se comprises forming the first layer of Ag_2Se such that the ratio of the layer of Ag_2Se thickness to the first layer of Ge_xSe_{100-x} thickness is between approximately 5:1 and approximately 1:1.

37. (Original) The method of claim 30, wherein the act of forming the first layer of Ge_xSe_{100-x} comprises forming the first layer of Ge_xSe_{100-x} having a thickness between approximately 100 Å and 1000 Å.

38. (Original) The method of claim 30, wherein the act of forming the second layer of Ge_xSe_{100-x} comprises forming the second layer of Ge_xSe_{100-x} having a thickness between approximately 100 Å and 1000 Å.

39. (Original) The method of claim 30, further comprising forming a second electrode on the tungsten layer subsequently to the act of etching the stack and the tungsten layer.

40. (Original) The method of claim 39, wherein the act of forming the second electrode comprises forming the second electrode such that it is common to a plurality of memory elements.

41. (Original) The method of claim 30, wherein the act of forming the first electrode comprises forming the first electrode such that it is common to a plurality of memory elements.

42. (Currently amended) A method of fabricating resistance variable memory elements, the method comprising:

forming a first electrode over a substrate;

forming a stack of layer by:

forming a first layer of Ge_xSe_{100-x} over the first electrode;

forming a first layer of Ag_2Se over the first layer of Ge_xSe_{100-x};

forming a second layer of Ge_xSe_{100-x} over the first layer of Ag_2Se;

forming a layer of Ag over the second layer of Ge_xSe_{100-x};

forming a third layer of Ge_xSe_{100-x} over the layer of Ag;

forming a protective layer on the third layer of Ge_xSe_{100-x};

forming a layer of photoresist on the protective layer;

exposing portions of the layer of photoresist to light;

developing the layer of photoresist;

subsequently etching ~~the stack~~ the first layer of Ge_xSe_{100-x}, the Ag_2Se layer, the second layer of Ge_xSe_{100-x}, the Ag layer, the third layer of Ge_xSe_{100-x} and the protective layer to form a pillar structure;

removing the layer of photoresist; and

forming a second electrode on the protective layer, the second electrode being common to a plurality of memory elements.

43. (Original) The method of claim 42, wherein the act of forming the protective layer comprises forming a layer of a light blocking, conductive material in which silver is substantially insoluble that is etchable when etching the stack.

44. (Original) The method of claim 42, wherein the act of forming the protective layer comprises forming a layer of tungsten.

45. (Original) The method of claim 44, wherein the act of forming the layer of tungsten comprises forming the layer of tungsten having a thickness between approximately 50 Å and approximately 100 Å.